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ABSTRACT

The educational reform movement of the 1980s has sparked a renewed emphasis on the quality of teaching and learning, not only in community colleges, but at every level of education. Most teachers embark upon their careers knowing very little about teaching and learning and, unfortunately, remain naive observers of their profession. Classroom research provides an opportunity for teachers to sensitively and knowledgeably observe their students' learning and the day-to-day effects of their teaching. Drawing upon stimulus-response and cognitive psychological theories of learning, classroom research calls upon college teachers to obtain feedback from their students throughout the semester and to use the results to form or shape instruction as it progresses. Classroom research increases the productive interactions between teaching and learning by investigating what teachers do to cause learning. The tools of classroom research are necessarily different from the statistical methods of traditional educational research. One tool, called "Minute Papers," asks students to state the most important thing they learned during a class session and identify the questions that remain uppermost in their minds. Classroom research methods are designed to integrate research on the effectiveness of instruction into everyday teaching on an ongoing, self-renewing basis. The teaching orientation and comprehensive curricula of the community college make it the ideal arena for classroom research. (JMC)

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IMPROVING LEARNING IN COMMUNITY COLLEGES*

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The program planners for this Conference have chosen the theme, "Renaissance '89." My dictionary defines renaissance as a "new birth, rebirth, or revival." Thus your conference theme seems to imply that revitalization of community colleges is necessary or desirable, and it also suggests that a renaissance is on the way. I think both of those assumptions may be true.

In the late 1970's, I had an opportunity to collect some data on how a variety of people — from teachers and administrators to community residents and trustees — were perceiving the community college mission in the United States. The picture was not overly upbeat; it appeared that community colleges had lost some of their vitality and were resting from the frantic building activities of the 1960's. I concluded my analysis with these predictions of Renaissance '89:

> "The late 1970's and early 1980's represent a plateau between two periods of high energy and a sense of mission in community colleges. Th old ideals that sparked enthusiasm and a sense of common purpose in community colleges have receded, and new ideals have not yet emerged to take their place." (Cross, 1981, p. 113)

* Prepared for the 1989 Conference of the Association of Canadian Community Colleges. Regina, Saskatchewan, Canada, May 29, 1989.

The old ideals were, of course, access and equal opportunity. That mission inspired a generation of community college administrators and faculty to high enthusiasm, vigorous promotion of the community college ideal, and just plain hard work at the difficult, yet challenging task of providing a college education for the largest proportion of the population in history.

Then, in Canada, as well as the United States, the 1980's brought the twin problems of demographics and economics. Modest student growth, combined with limited resources, slowed community college expansion as well as the expansive mood of egalitarian education. Those were the external realities, but there were internal problems as well, as teachers and administrators discovered the disillusionment that followed unprecedented access. Mina Shaughnessy wrote eloquently of the feeling that overtook her as an English teacher when the City University of New York opened its doors in 1970 to every resident of New York City with a high school diploma.

> "I remember sitting alone," she wrote, "in the worn urban classroom where my students had just written their first essays and where I now began to read them, hoping to be able to assess quickly the sort of task that lay ahead of us that semester. But the writing was so stunningly unskilled that I could not begin to define the task nor even sort out the difficulties. I could only sit there, reading and rereading the alien papers, wondering what had gone wrong and trying to understand what I at this eleventh hour of my students' academic lives could do about it." (p. vii)

Like Mina Shaughnessy, many community college teachers faced up to the task and tried to understand what had gone wrong and what they could do about it. But a decade ago when Shaughnessy wrote her classic book on the teaching of basic writing (1977), no one knew how to deal with the learning problems of open admission students. Quoting Shaughnessy again,

> "...there were no studies nor guides, nor even suitable textbooks to turn to. Here were teachers trained to analyze the belletristic achievements of the centuries marooned in basic writing classrooms with adult student writers who appeared by college standards to be illiterate. Seldom had an educational venture begun so inauspiciously, the teachers unready in mind and heart to face their students, the students weighted by the disadvantages of poor training yet expected to 'catch-up' with the front runners in a semester or two of low-intensity instruction." (p. 3)

That inauspicious beginning blossomed into an energetic attack on some of the most stubborn problems in education. But most of what teachers learned, they learned through their own experience in the classroom. There was little professional knowledge and research to sustain the effort. Once the door of higher education has been opened to previously unserved segments of the population, there remains the question of how to fulfill the promise of access.

Ironically, perhaps, the revitalization of the community college mission is coming from the educational reform movement of the 1980's and the call for more attention to quality. Community colleges are, first and foremost, teaching institutions. And the re-

vitalization of the teaching profession is having a profound and energizing effect on community colleges.

In the United States, the teaching mission of community colleges has been vigorously re-asserted by the Commission on the Future of Community Colleges, appointed by the American Association of Community and Junior Colleges in 1986. Their report, presented at the 1988 annual meeting of the AACJC, received a standing ovation from the more than 3,000 community college leaders present. And I perceived a return of the old community college enthusiasm and sense of common purpose.

The report entitled "Building Communities," defines community "not only as a region to be served, but also as a climate to be created." That climate, as the Commission sees it, will to a great extent be established by the teaching faculty. The report states it this way:

> "At the center of building community there is teaching. Teaching is the heartbeat of the educational enterprise and, when it is successful, energy is pumped into the community, continuously renewing and revitalizing the institution. Therefore, excellence in teaching is the means by which the vitality of a college is extended and a network of intellectual enrichment and cultural understanding is built. . .Thus, building community through dedicated teaching is the vision and inspiration of this report." (pp. 7-8)

Without question, the educational reform movement has sparked renewed emphasis on the quality of teaching and learning, not only in community colleges, but at every level of education, from

grade school through grad school. The quality of education depends ultimately on what happens when teachers meet students in the classroom.

Most of us have been in classrooms a good share of our lives, both as students and teachers. We have had ample opportunity to observe a great variety of teachers, both good and bad. I figure that by the time we finish college, we have had roughly 75 different teachers, an opportunity to observe them for thousands of hours, and to make some assessment of the impact of their teaching on at least our own learning, and usually plenty of hearsay about their impact on the learning of our classmates. That data base would be an incredible luxury to any educational researcher. To my knowledge, none of my colleagues doing research on teaching has ever received a grant that would permit such close observation of such a wide variety of teachers over such a long period of time. And yet despite extensive opportunities to observe teaching and learning, most of us embark upon our teaching careers knowing very little about it.

It occurred to me as I walked home in the dark the other night that I look at the heavens every night, or at least am aware of--and sometimes in awe of -- stars, moon, and changing patterns in the sky. Yet I know almost nothing about astronomy. I am a naive observer of the heavens, just as most of us are naive observers of teaching. Were I a trained observer or an astronomer, I would find things of fascination that the untrained eye fails to see. I would know what to look for, and I would grow in understanding and knowledge. My walk home would do more than take me to my destination. It would

be an new experience each evening, a source of energy, an opportunity for growth.

The analogy could be carried to listening to a symphony orchestra or watching the ocean. Most of us appreciate a good symphony when we hear one, but the trained musician hears the nuances that distinguish outstanding performance from the average, and she takes delight in hearing the subtleties of subthemes and supporting chords. The trained musician has a sophisticated ear that permits her to hear things the rest of us don't hear and to grow in her ability to appreciate the fine tuning that makes for excellence. Similarly, when I look at the ocean, I see tides and waves and changing color, and certainly anything that moves such as a boat or a seal. But I don't see the infinite complexity that is apparent to the oceanographer, nor do I take delight in learning and constantly adding to my knowledge and appreciation. I am a naive observer--even if on occasion a delighted one.

Most of us are naive observers of teaching and naive practitioners of the art and science of teaching as well. We don't know enough about the intricate processes of teaching and learning to be able to learn from our constant exposure to the classroom. We see the big things. We can spot a dozing student, one lost in some other world, or an eager hand waver. We know some things that are not supposed to happen. We don't want embarrassing silences when we ask a question; certainly we don't want hostility, or obvious inattention. If these things happen, we may actively seek to learn their causes. But we are not trained to observe the more subtle measures of learning.

Indeed, we are not even trained to question our assumptions. We assume that what we say is heard accurately and retained by students, despite consistent evidence to the contrary. We assume that students can connect thoughts and write or communicate ideas and knowledge, and we are perpetually shocked at the consistency with which this turns out not to be true. But as naive observers, we don't question what we don't understand. Were we astronomers or oceanographers, we would pursue with great interest something that challenged our expectations or predictions. Are we curious about why students don't learn, why they come up with distorted ideas about what we thought was perfectly clear, why they fail to hear or follow the simplest directions? Well maybe -- fleetingly. But by and large, we don't set out to investigate these common departures from what we know should happen in class. We are soon on to other things, and the opportunity to learn from the experience is lost.

I must admit, of course, that even academics don't have to make everything into a learning experience. There are times when we want to simply relax without feeling an obligation to analyze or understand or improve ourselves or others. I can probably afford to be a naive observer of the nighttime sky, despite my recognition that some knowledge of astronomy would almost certainly add to my enjoyment.

But the college classroom is not the place for relaxed naivete for either students or faculty. The experience would be far richer and more enjoyable if both teachers and students were more curious and more sophisticated about learning and the impact of teaching on

it. But even more important, as educators, we have an obligation to understand the teaching/learning process well enough to improve it.

I want to talk today about Classroom Research as an opportunity for teachers to become sensitive and knowledgeable observers of learning as it takes place day by day in their classrooms. Teachers, especially community college teachers, have a particularly good opportunity to observe both the stumbles and triumphs of learning because of the rich diversity of their student populations. The bright side of the concentration of students with learning problems in community colleges is that sometimes the best way to understand a process is to look at what goes wrong when things aren't working right. Students with learning difficulties -- whether stemming from poor attitude, lack of background knowledge, or lack of skills -- can try the patience of a saint or they can serve as windows through which to view the complexities of human learning.

Teaching as art or science or voo-doo is in an essentially primitive state of development We are not standing on the shoulders of giants in advancing knowledge and improving practice with each generation of teachers. It is a fairly good guess that teachers coming out of graduate schools today are not doing any better job of teaching than those graduating 50 years ago. That is not to say that their field of study hasn't made advances; it is simply to recognize that each young teacher starts from the beginning to learn how to teach. Education has become too important to human survival and progress to continue such an inefficient and ineffective approach to classroom instruction.

It is time to make college teaching a profession -- a profession that is growing and improving over the decades as well as one that has the potential for continuous self-renewal for individual teachers. Most of us teach as we were taught. And despite the fact that we are not very astute observers of the impact of teaching on our own learning, general patterns of classroom practices are picked up and perpetuated generation after generation without much question or evaluation of their effectiveness.

If we are serious about educational reform, then classroom teachers are going to have to play a more active role in observing what students are learning, and then using the results of that assessment to experiment with improving the learning of the students in their own classrooms. That means more teacher involvement in the search for knowledge about teaching and learning.

For some time now, researchers on teaching and learning have been moving toward greater involvement of classroom teachers in the design and conduct of research. First it was the use of teachers on advisory boards to help determine the questions for research. Then it was "R & D," standing for the involvement of teachers in the implementation of research findings, then it was cooperative research, and most recently collaborative research.

I have been proposing a more radical move yet. I believe that teachers in teaching institutions, especially community colleges, should be **doing** research on teaching and learning in their own subject matter specialities. Classrooms make excellent laboratories for the study of learning, and teachers can learn a great deal by

systematically observing how their teaching affects students' learning. I call this Classroom Research.

The focus of Classroom Research is students rather than teachers. This is an important reversal of the usual approach to faculty development in which we have usually worked with teachers to improve their teaching. Our ultimate purpose in education, however, is to improve students' learning. Teaching and learning are not necessarily two complimentary aspects of the same phenomenon. Learning can and does go on without teaching. More unfortunately, teaching can and does go on without learning. While learning has many purposes, teaching has only one. The sole purpose of teaching is to enable or cause learning. No matter how brilliant or well-prepared a lesson, it fails the teaching function if it does not result in learning.

The most obvious way to increase the productivity of education is to reduce the gap between what is taught and what is learned. An analogy can be drawn between teaching and learning and buying and selling--though I don't wish to carry the analogy so far as to imply the "retailing" of learning as a product. We in education, through example and effort, are in the business of promoting learning as a **process**. But consider the analogy: we would not claim that something had been sold unless something had been bought. Similarly, we cannot claim that something has been taught if nothing has been learned.

The bottom line in education, as in business, is not in what we offer, but in what students take away with them. We could lay out a beautiful program of studies and prepare a well-organized and

knowledgeable lesson-- all to no avail if students don't learn from it. The reverse is also true, of course. We could have wonderful teachers struggling with a trivial and trendy curriculum, and students could learn it, but it wouldn't be worth their investment.

Classroom Research is different from, but complimentary to, more traditional forms of educational research. When I was in graduate school, educational psychology was dominated by B. F. Skinner and the behaviorists. We believed in stimulus-response or S-R theories of learning. The stimulus evoked the response, and we didn't much care — certainly we thought it "unscientific" to study — what went on in the mind of the learner.

The great contribution of today's cognitive psychologists is that they do care about the learning process. They are finding that one of the major differences between successful and unsuccessful learners is that learners monitor and direct their own learning; they are aware of themselves as learners. Researchers call this "metacognition."

Good learners, we know, are active learners — not just active participants in class, but mentally active as they study. Some examples of metacognitive strategies are these:

- Rehearsal. Good students are likely to rehearse what they are learning through activities such as repetition and underlining.

- Elaboration. Active learners often elaborate or extend their learning through summarizing or paraphrasing what they read or hear.

- Organization. Grouping similar concepts together or using outlining categories are metacognitive strategies that help students remember through establishing relationships.

- Comprehension-monitoring. Students who study using self-questioning and self-testing are engaging in metacognitive strategies to evaluate their progress as learners (Weinstein and Mayer, 1986).

Most good teachers probably use repetition, paraphrasing, summarizing, grouping, and questioning for comprehension as teaching methods. But we don't often help students to become more efficient learners, and we don't often think about how teaching might make more impact on what and how students learn. We could make our teaching more knowledge-based and professional by defining some learning situations for students and systematically observing how they go about solving problems or addressing ideas.

Classroom Research calls on college teachers to obtain feedback from the students in their classes throughout the semester. This approach has been called "formative evaluation," meaning that the results of the evaluation can be used to form or shape the instruction as it is in progress. The information collected in the Classroom Research should be relevant to a given teacher's goals and should be frequent enough and specific enough to enable teachers to know how their teaching is affecting student's learning.

The purpose of Classroom Research is not to grade students nor to evaluate teachers. It is to increase the productive interactions between teaching and learning. If teaching is to become a respected profession, based on skills and knowledge, we must move boldly to ask what teachers can do to *cause* learning, and we must shift our fo-

cus from the detached study of teaching *and* learning to the involved study of teaching *for* learning.

The point is that we should be teaching smarter than we were 50 years ago. We should be accumulating the knowledge that would enable us to move the profession of teaching into the 21st century. Teaching, by and large, still operates on S-R Theories. The test question is the stimulus; the answer is the response, and we don't know what goes on in between.

It is not going to be easy to develop the techniques that will turn those hyphens into windows that give us better insights into learning processes. The tools for Classroom Research are necessarily different from the statistical standbys of traditional educational research. Those of us who were trained in the correlational methods of educational research, for example, cannot explain how teaching *causes* learning, and so we speak cautiously of teaching *and* learning as though they were on parallel tracks that never intersect. Unfortunately that image may be all too accurate in many college classrooms. The teacher who is determined to "cover the material" may be half way down her track before she realizes that most of the students have been left behind on a parallel track.

Another notable difference between methods of classroom research and those of educational research is that educational researchers are necessarily interested in research skills and techniques that will enable them to generalize their findings from the sample they have studied to the population they wish to affect. Classroom Researchers, however, *start* with the population they wish to affect; that population consists of the students in their classrooms. They are

trying to answer the very specific question, What are **my** students learning in **my** classroom as a result of **my** instruction? Thus, knowledge of sampling theory and the statistics of significant differences, the old standbys of social science research, are not required for Classroom Research. While the results of Classroom Research will almost certainly enhance the knowledge of the instructor, they may or may not advance knowledge in general or contribute to learning theory; they may or may not be publishable; they may or may not utilize standard social science research techniques and designs.

Let me give some examples of Classroom Research to make the concept concrete. One of our first activities in the Classroom Research project was to develop some simple classroom assessment techniques that could be used by faculty members in any discipline to get feedback from students on what they were learning.

After a search of the literature and some modifications and inventions of our own, we came up with 30 classroom assessment techniques which we published in a Handbook for Faculty (Cross and Angelo, 1988). One very simple classroom assessment technique is called "Minute Papers." It was developed by a physics professor at the University of California, Berkeley. (Wilson, 1986). A few minutes before the end of the class period, the instructor asked students to write the answers to two questions: 1) What was the most important thing you learned today? and 2) What questions remain uppermost in your mind as we conclude this session?

I have used Minute Papers in my own graduate classes at Harvard and at Berkeley, and I must say that this quick and easy

feedback device tells me more about my own teaching than anything I have ever used. It is more specific and timely than term papers, and it is more open-ended and subject to student selection of important points than a quiz or exam. An added advantage is that it forces students to think about the high points and to summarize and synthesize the day's lesson. Moreover, it implies that they should be actively thinking about new questions. I continue to be amazed and dismayed at the inability of students to come up with anything at all that was important to their learning after one of my brilliant lectures. With experience, they become much better at it, as they are forced to synthesize, summarize, and paraphrase in order to answer the questions that may be asked on the "minute papers" at the conclusion of the class period.

While I am not going to administer "minute papers" to you at the end of this lecture, I am going to leave plenty of time for questions. So I hope you are actively thinking about how you might apply Classroom Research to your own classroom or in a program of faculty development at your college.

The 30 techniques that Tom Angelo and I have described in our handbook are generic, that is they can be used to assess students' learning across a variety of disciplines. But we are now in the process of preparing Handbook II which will contain a second generation of classroom assessment techniques that are discipline specific. In this effort, we are assisted by some fifty faculty members from three community colleges in the San Francisco Bay Area. Some examples of their projects in classroom assessment may give you a better idea of the nature of the classroom assessment

techniques that they are developing as a first step toward classroom research.

A pre-calculus teacher had long been troubled by the extreme diversity of math backgrounds in his course, so prior to the teaching of each new unit, he developed a brief questionnaire to determine students' familiarity with the procedures and terminology of the new material. With this "background probe," he could anticipate where students would run into difficulties and could modify his teaching accordingly. He reported that an unanticipated benefit was students' appreciation of his concern and interest in their background for the unit.

Another example comes from an English teacher who was never quite sure what students were really learning from small-group sessions in which the task was to critique one anothers' papers. She used a modified version of "minute papers." She asked students to take a few minutes at the end of the class period to write the answers to these two questions: First, what have you learned today about your own writing? Second, what did you contribute to the learning of others in the group? A side benefit of her study was that students gave increased attention to providing constructive criticism to their classmates and to listening carefully to their suggestions for improvement.

A final example will make clear the simplicity of the tasks that we are encouraging in these early efforts. The primary purpose of a course in third-semester calculus was to prepare students for advanced courses in engineering and physics. The question the teacher of this course chose to investigate was, Were students, in

fact, able to apply math in the learning of science concepts? He collected simple applications from his colleagues in the science department and determined how well students could handle them, and then experimented to see how he could help them learn more effectively. A side benefit of his project was the conversation and collaboration of teachers across departments.

In our experience so far, we have found it hard to get teachers to keep their questions for investigation simple. Many teachers initially propose studies patterned after the research they have seen or read about — experimental studies of the relative effectiveness of lecture versus discussion for example, or an investigation into intellectual development, or studies of cognitive styles. The problem with this interpretation of Classroom Research is that most faculty lack the technical skills, time, and resources to conduct basic educational research and also the background that comes from extensive reading of the state of existing knowledge in the field. Thus they are likely to re-invent the wheel and to face discouragement over their lack of technical and research skills in conducting credible social science research.

In making these observations, I do not intend to mystify research by contending that classroom teachers can't do it, or to discourage serious inquiry into learning issues that interest teachers. Some faculty are sufficiently interested in these broader questions about teaching and learning to inform themselves and develop adequate skills for investigation. Indeed some of our early participants in the Bay Area project have become sufficiently interested in learning that they are eager to equip themselves for

investigation into more complex problems. A physics teacher, for example, has conducted some very imaginative research on the role of visualization in problem solving. Students may use the chalkboard, paper and pencil, clay, or anything else that helps them show him how they are visualizing the problem. He then videotapes the explanations of students as they describe the pictures that led to their solution or lack of solution. Students, he finds, become fascinated with the process of learning, thereby increasing both their motivation and skill in problem solving. For this teacher and his students, the learning process itself has become an important part of the class.

Our goal in Classroom Research is not to **add** research projects to already heavy teaching loads, but to integrate research into everyday teaching. A well-designed Classroom Research project should teach as well as provide feedback about the effectiveness of that teaching. A study of critical thinking in the classroom, for example, might begin with the assignment of a task that requires critical thinking and permits systematic observations about how students approach the task and how well they perform. The Classroom Researcher would then experiment with modifications in the design of the task and its presentation, followed by a re-evaluation of the effectiveness of the changes.

Classroom Research is more a continuous, ongoing study of teaching and learning in the everyday classroom than a single investigation of a question, collection of data, and publication of the results. It is this ongoing, self-renewing feature that gives it its

distinction as a faculty development activity capable of generating high interest and improved performance.

Now that you have a general notion of what Classroom Research is, let me conclude these remarks with some observations about why I think that Renaissance '89 heralds the revitalization of community colleges through special expertise in teaching and learning. Community colleges are in a better position than any other institution of higher education to take the lead in developing both the scholarly and practical dimensions of expertise in college-level teaching for a number of reasons:

First, community colleges are teaching institutions. Their faculties are hired on the premise that they are first and foremost teachers. Thus, they are, and should be, curious about learning and the impact they make as teachers on students' learning. I hope that faculty in community colleges will seize the opportunity to establish themselves as authorities on teaching and learning -- as researchers as well as practitioners in the art and science of teaching.

A second reason for suggesting community college leadership in Classroom Research is that no other type of institution has quite the challenge or quite the obligation for excellence in teaching that the community college has. Battles won for access and equal opportunity are meaningless unless the populations newly admitted are gaining access to education that makes some difference in their lives. Improving the quality of teaching and learning is the logical next step for colleges that led the way in opening the routes of access to college. Community colleges can and should continue to work on access and retention, along with every other type of institution in

higher education, but the task that will energize community colleges and lead to the renaissance is the development of special expertise and knowledge about the teaching/learning process.

Third, the curriculum of the comprehensive community college offers a rich and potentially productive laboratory for gaining knowledge about learning. No other type of institution offers such a wide range of learning experiences for study. The curricular mix of vocational, academic, developmental, and adult education, offers one of the richest resources available for study.

Fourth, classroom teaching is especially important to commuting students. The research of the past quarter of a century shows that much of the "value added" of a college education comes from the total environment of the college -- the dorms, extra-curricular activities, and out-of-class relationships with students and teachers. Because virtually all community college students are commuters, rushing from job and family responsibilities to class without much time to trade ideas or reactions with fellow students, whatever education these students get from college will depend heavily on their classroom learning experiences. As the college experience becomes part-time for a majority of college students in the 21st Century, and most students begin to live off-campus, the classroom bears an increasingly heavy burden for the development of the skills, values, and appreciations that we associate with educated persons.

Fifth, the practical orientation of community college teachers assures that the problems for Classroom Research are real problems that affect college teachers in their classrooms. To date, educational

research has not had much impact on teaching. Teachers claim, I think with considerable justification, that what interests researchers does not interest them. There is little, they say, in the thousands of research studies conducted each year that is directly applicable to their classrooms. I hope that Classroom Research will remain strongly tied to the classroom, addressing questions that teachers find interesting and useful.

Finally, the diversity of the community college student population is an advantage in studying the learning process. Diversity in student populations is increasing in classrooms throughout North America. Community college teachers work with an enormous variety of learners -- slow learners and fast, mature learners and immature, experienced and naive, motivated and unmotivated, skilled and unskilled, interested and disinterested. Such diversity presents itself everyday in community college classrooms, and it offers an unusual opportunity to study learning across the spectrum.

In summary, the mission, the curriculum, the students, and the faculty of community colleges make them ideal laboratories for the study of teaching and learning at the college level.

The 1980s has been a troubled decade for higher education. Resources have been scarce, while criticism has been plentiful. But now, it appears that almost everything that needs to be said has been said, and it is time to act. I believe that "Renaissance '89" has arrived, and that excellence in teaching and learning will be the hallmark of community colleges as they enter the 21st Century.

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